CLAIMS

I claim:

1. A circuit providing constant average current, said circuit comprising:

a full-wave bridge rectifier providing a rectified DC power output;

a micro-controller for monitoring a component of said rectified DC power, evaluating said monitored component and providing an output signal in response to said evaluation of said monitored component;

an output switch operating in response to said output signal for selectively providing said rectified DC power at a constant average current to an electrical device connected electrically in series with said full-wave bridge rectifier and said output switch.

2. The circuit of claim 1, wherein said monitored component of the rectified DC power is the voltage.

3. The circuit of claim 1, wherein said monitored component is evaluated with respect to a setpoint measured in volt-seconds.

4. The circuit of claim 1, wherein said constant average current is obtained by applying constant volt-seconds to said electrical device.

5. The circuit of claim 1, wherein said monitoring, evaluating and providing said output signal are concurrent operations initiated by a trigger.

6. The circuit of claim 5, wherein said trigger is a regularly spaced event determined by said micro-controller.

7. An open loop voltage sag compensator circuit comprising:

a full-wave bridge rectifier providing a rectified DC power output;

a micro-controller for monitoring a component of said rectified DC power at evenly spaced intervals, evaluating said monitored component with respect to a setpoint and providing an output signal in response to said

evaluation of said monitored component;

an output switch operating in response to said output signal for selectively providing said rectified DC power at a constant average current to an electrical device connected electrically in series with said full-wave bridge rectifier and said output switch.

8. The voltage sag compensation circuit of claim 7, wherein said monitored component of the rectified DC power is the voltage.

9. The voltage sag compensation circuit of claim 7, wherein said setpoint is measured in volt-seconds.

10. The voltage sag compensation circuit of claim 7, wherein said constant average current is obtained by applying constant volt-seconds to said electrical device.

11. The voltage sag compensation circuit of claim 7, wherein said monitoring, evaluating and providing said output signal are concurrent operations initiated by a trigger and occurring during a trigger period.

12. The voltage sag compensation circuit of claim 11, wherein said trigger is a regularly spaced event determined by said micro-controller and said trigger period is the interval between triggers.

13. The voltage sag compensation circuit of claim 12, wherein said setpoint is determined by said trigger period and a particular electrical current level required to maintain said electrical device in a desired operating condition.

14. The voltage sag compensation circuit of claim 7, wherein said micro-controller continuously evaluates said monitored component with respect to a dropout setpoint.

15. The voltage sag compensation circuit of claim 14, wherein said micro-controller initiates an output signal placing said electrical device in a dropout condition and enters a sleep mode for a predetermined period of time if said monitored component drops below said dropout setpoint.

16. The voltage sag compensation circuit of claim 15, wherein said micro-controller wakes up after said predetermined period of time and if said monitored component is above said dropout setpoint initiates said evaluating of said monitored component with respect to said setpoint and providing said output signal to said output switch for providing said constant average current to said electrical device.

17. The voltage sag compensation circuit of claim 15, wherein said micro-controller wakes up after said predetermined period of time and if said monitored component is below said dropout setpoint terminates further monitoring of said monitored component thereby maintaining said electrical device in said dropout condition.

18. A Finite State Machine control circuit for controlling an inductive load during a voltage sag event, said Finite State Machine comprising:

a pull-in state wherein an output of said Finite State Machine is ON, said control circuit, receiving voltage from a rectified DC power source, providing a pull-in current sufficient to initiate an inductive load into a pull-in condition;

a wait for trigger state wherein said output of said Finite State Machine is OFF, said control circuit, receiving voltage from said rectified DC power source, not providing current to said inductive load, said inductive load being in a holding condition;

an apply volt-seconds state wherein said output of said Finite State Machine is ON, said control circuit, receiving voltage from said rectified DC power source, providing a constant average current sufficient to maintain said inductive load in said holding condition during a normal voltage condition of said rectified DC power source and during a voltage sag in said rectified DC

power source; and

a dropout state wherein said output of said Finite State Machine is OFF, said control circuit terminating current to said inductive load when said voltage sage in said rectified DC power source reaches a predetermined sag level for a predetermined time, thereby causing said inductive load to enter a dropout condition.

19. The Finite State Machine control circuit of claim 18 wherein said wait for trigger state and said apply volt-seconds state operate as a loop to maintain said constant average current at a level sufficient to maintain said inductive load in said holding condition by applying constant volt-seconds to said inductive load.

20. The Finite State Machine control circuit of claim 18 wherein said predetermined time is sufficient to ensure that current flow in said inductive load has stopped.